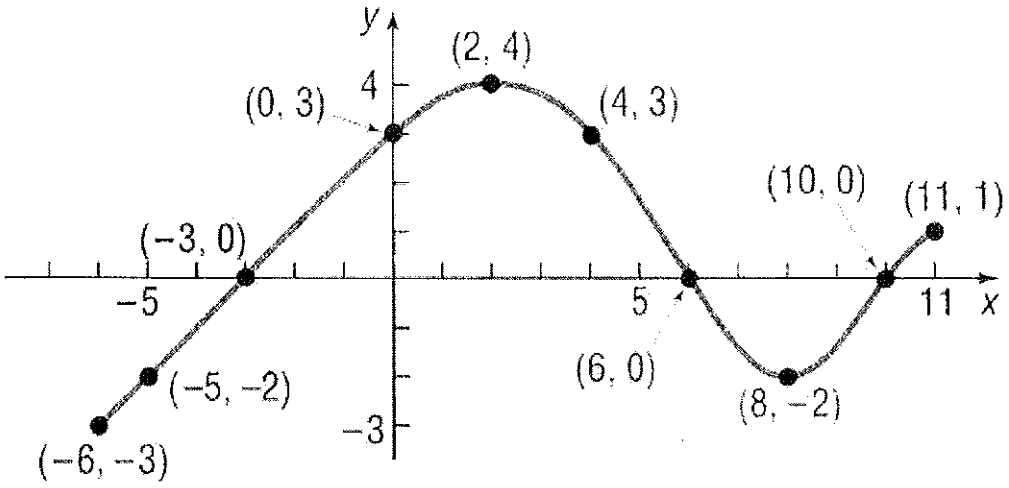
Precalculus (A)
1.7 & 1.8 Notes

Name: KEY

Interpreting Information from the Graph of a Function

Example 1: Use the graph of y = f(x) below to answer the following questions.



1) Find the following function values: f(0) = 3 f(-6) = -3 f(6) = 0 f(11) = 1

2) Is f(7) positive or negative? Neg Is f(-2) positive or negative? Pos

3) For what numbers x is f(x) = 0? x = -3, x = 6, x = 10

4) For what numbers x is f(x) > 0? (-3, 6) ← interval notation

5) What is the domain of f(x)? [-6, 1] What is the range of f(x)? [-3, 4]

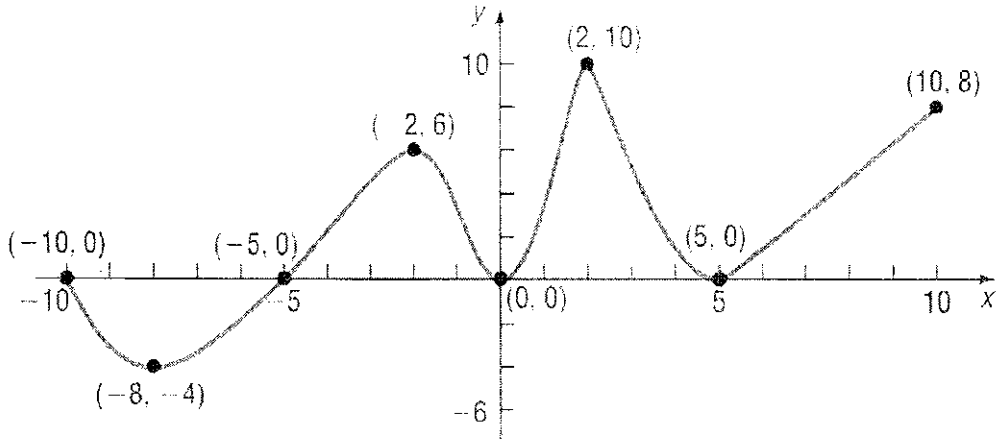
6) What are the x-intercepts of f(x)? x = -3, x = 6, x = 10 What is the y-intercept of f(x)? (0, 3)

7) How often does the line $y = \frac{1}{2}$ intersect the graph? 3 times

8) How often does the line x = 5 intersect the graph? once (its a vertical line test!)

9) For what values of x does f(x) = 3? x = 0, x = 4 For what values of x does f(x) = -2? x = -5, x = 8

Example 2: Use the graph of y = f(x) below to answer the following questions.



1) Is f(x) increasing on the interval (-8, -2)? Y Is f(x) increasing on the interval (2, 10)? N

2) Is f(x) decreasing on the interval (-8, -4)? N Is f(x) decreasing on the interval (2, 5)? Y

3) List the interval(s) on which f(x) is increasing. $(-8,-2) \cup (0,2) \cup (5,10)$

4) List the interval(s) on which f(x) is decreasing. $(-10,-8) \cup (-2,0) \cup (2,5)$

5) Is there a local maximum at 2? Y If yes, what is the maximum value? 10

6) Is there a local maximum at 5? N If yes, what is the maximum value? NA

7) List the x values at which f(x) reaches a local maximum. x = -10 x = -2 x = 2 x = 10
State the corresponding maximum values for each. y = 0 y = 6 y = 10 y = 8

8) List the x values at which f(x) reaches a local minimum. x = -8 x = 0 x = 5
State the corresponding minimum values for each. y = -4 y = 0 y = 0

9) State the coordinates of the absolute maximum. (2, 10)

10) State the coordinates of the absolute minimum. (-8, -4)

11) State the values for which $f(x) \leq 0$. $[-10, -5] \cup x = 5$

12) State the domain of f(x) $[-10, 10]$ State the range of f(x) $[-8, 10]$

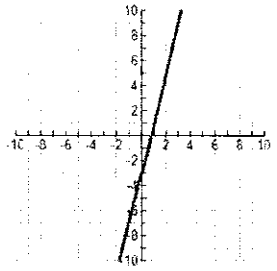
Even $f(x) = f(-x)$ → symmetry around y

Odd $f(x) = -f(x)$ → symmetry around origin

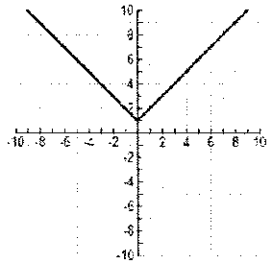
Even, Odd, or Neither Worksheet Name: _____

Determine whether the following functions are even, odd, or neither.

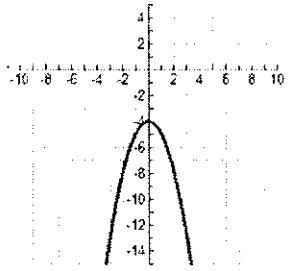
1. f(x)= 4x – 3 Neither



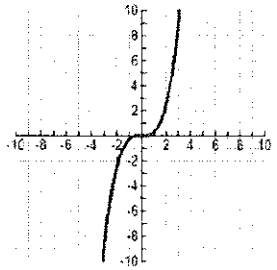
2. f(x)= $|x|+1$ Even



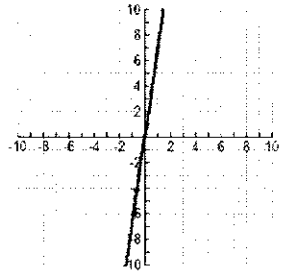
3. f(x)= $-x^2-4$ Even



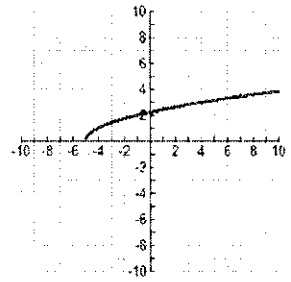
4. f(x)= $\frac{1}{3}x^3$ Odd



5. f(x)= 7x Odd



6. f(x)= $\sqrt{x+5}$ Neither



7. f(x)= $3x^2$

Even

$3x^2 = 3(-x)^2$

8. f(x) = $x^3 - 2$

$(-x)^3 - 2 = -x^3 - 2$

Neither

9. f(x)= 3x + 4

Neither

10. f(x)= $x^2 - 5$

Even

11. f(x)= 10x + 5

Neither

12. f(x)= $2(x+1)^3$

Neither

Calculating Inverse Functions

For the following functions find:

a. The inverse function
b. Write the inverse function using inverse function notation
~~c. State the domain and range of the original function~~
~~d. State the domain and range of the inverse function~~

1. $f(x) = 3x - 2$

$f^{-1}(x) = \frac{x+2}{3}$

2. $g(x) = \frac{1}{x} - 2$

$g^{-1}(x) = \frac{1}{x+2}$

3. $h(x) = \sqrt{1+x}$

$h^{-1}(x) = x^2 - 1$

Verifying Inverse Functions

1. Suppose $f(x)=2x-4$ and $g(x)=\frac{x+4}{2}$. Are f and g inverse functions?

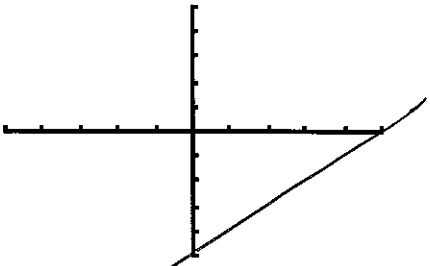
a) Use algebraic methods to verify. That is, find $f(g(x))$ and then find $g(f(x))$.

you must find $f(g(x))$: $2\left(\frac{x+4}{2}\right)-4 = x+4-4 = x$ ✓ ☺

you must find $g(f(x))$: $\frac{(2x-4)+4}{2} = \frac{2x}{2} = x$ ✓ ☺

what do you conclude?

b) Demonstrate the inverse relationship by means of a graph:



c) Explain verbally:

Describe in words what f "does to its input."	Describe in words what g "does to its input."
i. ii.	i. ii.

d) Fill in the cells for the output and then explain the inverse relationship:

$f(x)=2x-4$							
input	2	3	4	5	6	7	8
output							
$g(x)=\frac{x+4}{2}$							
input	0	2	4	6	8	10	12
output							

9. Let $f(x) = x^2 + 3$ and $g(x) = 2x + 1$.

a. $f(7) =$ 52

b. $g(3) =$ 7

c. $f(g(3)) =$ 52

d. $f(f(3)) =$ 147

e. $f(g(x)) =$ $(2x+1)^2 + 3 = 4x^2 + 4x + 4$

f. $g(f(x)) =$ $2(x^2 + 3) + 1 = 2x^2 + 7$

g. $g(g(x)) =$ $2(2x+1) + 1 = 4x + 3$